

THE BRASSICACEÆ OF OHIO.

EMMA E. LAUGHLIN.

Brassicaceæ. Mustard Family.

Herbs, with watery sap of a pungent taste, not poisonous; with alternate, exstipulate leaves, usually large at the base of the stem and intergrading in form to the top of the stem. Flowers hypogynous, bisporangiate, usually isobilateral, appearing actinomorphic, regular, usually with glands, in racemes, short at first and elongating, or in corymbs; calyx of 4 sepals, deciduous, rarely persistent; corolla choripetalous, tetramerous, cruciform; stamens 6, tetradynamous, rarely 4 or 2; ovulary compound, bilocular, the parietal placentæ connected by a thin septum from which the valves separate when ripe; ovules 2 to several, campylotropous; fruit a silique if longer than broad, or a silicle if short, generally with 2 cavities, sometimes unilocular, dehiscent or in a few genera indehiscent; endosperm scanty; cotyledons accumbent, incumbent or conduplicate.

SYNOPSIS.

- I. Pod usually not more than twice as long as wide (a silicle); cotyledons accumbent or incumbent.
 - A. Pods more or less flattened parallel to the broad partition, dehiscent; cotyledons accumbent; leaves not lobed.
 1. Pubescence stellate or of forked hairs.

ALYSSEÆ.
Berteroa, Koniga, Alyssum, Draba.
 2. Pubescence of simple hairs or wanting; pods very broad and flat; leaves opposite.

LUNARIEÆ.
Lunaria.
 - B. Pods flattened at right angles to the partition or not flattened.
 1. Pubescence of forked hairs; cotyledons incumbent.

CAMELINEÆ.
Camelina, Bursa, Neslia.
 2. Pubescence of simple hairs or wanting.
 - a. Pod scarcely or not at all flattened; cotyledons accumbent.

COCHLEARIEÆ.
Armoracia, Neobeckia, Sisymbrium, Radicula.
 - b. Pods strongly flattened at right angles to the narrow partition.
 - (a) Pod dehiscent; cotyledons accumbent or incumbent.

LEPIDIEÆ.
Lepidium, Carara, Thlaspi.
 - (b) Pod indehiscent; cotyledons incumbent.

ISATIDEÆ.
Myagrum.

- II. Pod usually elongated-linear, more than twice as long as wide (a silique).
 A. Pod not transversely 2-jointed.
 1. Cotyledons accumbent or incumbent; pod not beaked, but often tipped with the style; seeds usually in one row in each cavity.
 a. Cotyledons incumbent.
 NORTEÆ.
 Alliaria, Sophia, Cheirinia, Erysimum, Norta, Conringia, Hesperis, Arabidopsis.
 b. Cotyledons accumbent.
 ARABIDEÆ.
 Barbarea, Iodanthus, Arabis, Cardamine, Dentaria.
 2. Cotyledons conduplicate; pod beaked.
 BRASSICEÆ.
 Sinapsis, Brassica, Diplotaxis, Raphanus.
 B. Pod transversely 2-jointed, fleshy, indehiscent; cotyledons accumbent.
 CAKILEÆ.
 Cakile.

KEY TO THE GENERA OF THE BRASSICACEÆ OF OHIO BASED ON THE FLOWER AND OTHER CHARACTERISTICS PRESENT AT ANTHESIS.

1. Flowers white. 2.
1. Flowers yellow. 19.
1. Flowers purple. 32.
2. Leaves simple, not lobed. 3.
2. Leaves deeply lobed or pinnatifid. 12.
3. Stems scapose; basal leaves in a rosette. *Draba*.
3. Stems leafy. 4.
4. Leaves entire. 5.
4. Leaves dentate, crenate or wavy. 6.
5. Petals bifid; plant hoary-pubescent. *Berteroa*.
5. Petals entire; plant appressed-pubescent; flowers fragrant. *Koniga*.
6. Basal and stem-leaves the same. 7.
6. Basal and stem-leaves different. 8.
7. Leaves broadly cordate, dentate; petals clawed. *Alliaria*.
7. Leaves orbicular, wavy; stems decumbent, stoloniferous. *Cardamine*.
8. Stem-leaves sessile; petals twice the length of the sepals. 9.
8. Stem-leaves clasping. 10.
9. Basal leaves oblanceolate, rosulate; stem-leaves lanceolate; pubescent with forked hairs. *Arabidopsis*.
9. Basal leaves obovate; stem-leaves lanceolate, narrowed at each end; pods scythe-shaped. *Arabis*.
10. Basal leaves oblanceolate, early deciduous; stem-leaves lanceolate; pods broadly winged. *Thlaspi*.
10. Basal leaves obovate or spatulate, dentate; flowers less than one-third inch broad. 11.
11. Racemes dense; silicles orbicular. *Lepidium*.
11. Racemes loose; siliques flat, linear. *Arabis*.
12. Basal and stem-leaves the same. 13.
12. Basal and stem-leaves different. 15.
13. Leaves deeply lobed or pinnatifid. 14.
13. Leaves palmately 3-lobed; stems leafless below; flowers corymbose. *Dentaria*.
14. Stems glabrous, aquatic, rooting at the nodes; end lobe of the leaf large. *Sisymbrium*.
14. Stems spreading; plants fetid; pods didymous. *Carara*.
15. Lower leaves pinnatifid; upper leaves dentate or entire. 16.
15. Lower leaves pinnatifid; upper leaves smaller and narrower. 18.
16. Lower leaves immersed, dissected; upper leaves lanceolate. *Neobeckia*.
16. Basal leaves large, rough but glabrous; root thick, pungent; pods seldom formed. *Armoracia*.
16. Basal leaves in a rosette or rosulate. 17.

17. Stem-leaves sagittate; pods triangular. *Bursa*.
17. Stem-leaves lanceolate, oblong or linear; pods orbicular. *Lepidium*.
18. Leaf-segments numerous, end one larger. *Cardamine*.
18. Leaf-segments very narrow; stems diffuse. *Arabis*.
19. Leaves simple, not lobed, entire, rarely dentate or repand. 20.
19. Leaves lobed or pinnatifid. 24.
20. Leaves spatulate or linear; sepals persistent; petals pale yellow. *Alyssum*.
20. Leaves lanceolate. 21.
20. Leaves ovate or oblong, cordate at the base. 23.
21. Leaves clasping by a sagittate base; silicles obovoid or globose. 22.
21. Leaves not clasping by a sagittate base; pubescent with 2-branched appressed hairs. *Cheirimia*.
22. Stems nearly simple, glabrous or slightly pubescent; pods pear-shaped, dehiscent. *Camelina*.
22. Stems branching, hispid; pods reticulated, indehiscent. *Neslia*.
23. Glabrous and glaucous; leaves oblong to lanceolate; longer stamens connate in pairs. *Myagrum*.
23. Glabrous, pale green; leaves obtuse; flowers pale yellow. *Conringia*.
24. Flowers small, less than one-third inch broad. 25.
24. Flowers large, more than one-third inch broad. 29.
25. Leaves deeply pinnatifid. 26.
25. Leaves bi-pinnatifid; sepals caducous. *Sophia*.
26. Plants of wet places; sepals and pedicels spreading. *Radicula*.
26. Plants of dry places. 27.
27. Leaves runcinate. 28.
27. Leaves lyrate; stems angled, glabrous. *Barbarea*.
28. Basal and stem-leaves similar; pods appressed. *Erysimum*.
28. Basal leaves runcinate; stem-leaves deeply pinnatifid; pods spreading. *Norta*.
29. Leaves lyrate or lobed. 30.
29. Leaves various. 31.
30. Plants hispid; pods constricted, dehiscent. *Sinapis*.
30. Plants rough, pods spongy, indehiscent. *Raphanus*.
31. Basal leaves lobed or pinnatifid; stem-leaves reduced to lanceolate. *Brassica*.
31. Basal and stem-leaves deeply pinnatifid into narrow lobes. *Diploaxis*.
32. Basal and stem-leaves similar. 33.
32. Basal and stem-leaves different. 35.
33. Leaves dentate, cordate, earliest opposite; petals clawed. *Lunaria*.
33. Leaves lanceolate, oblanceolate or obovate. 34.
34. Plants tall; flowers large, fragrant. *Hesperis*.
34. Fleshy plants of the seashore; pods short, 2-jointed. *Cakile*.
35. Leaves simple, not lobed. 36.
35. Leaves deeply lobed. 37.
36. Basal leaves rosulate; stem-leaves sagittate. *Arabis*.
36. Basal leaves orbicular, long-petioled; stem-leaves ovate, coarsely dentate, sessile; flowers corymbose. *Cardamine*.
37. Leaves pinnately lobed. 38.
37. Leaves palmately 3-lobed. *Dentaria*.
38. Lower leaves pinnatifid, clasping; upper leaves lanceolate; lateral sepals slightly gibbous at the base; petals long-clawed. *Iodanthus*.
38. Lower leaves lyrate; upper leaves small, rough; petals veiny. *Raphanus*.

KEY TO THE BRASSICACEÆ OF OHIO BASED UPON THE FRUIT AND OTHER CHARACTERISTICS PRESENT WITH THE FRUIT.

1. Fruit a silicle, not more than twice as long as broad. 2.
1. Fruit a silique, more than twice as long as broad. 14.
2. Pods flattened. 3.
2. Pods not flattened. 11.
3. Pods flattened parallel to the partition. 4.
3. Pods flattened at right angles to the partition. 8.
4. Stems scapose; basal leaves in a rosette; petals white. *Draba*.
4. Stems leafy. 5.

5. Leaves entire. 6.
5. Leaves dentate, cordate; flowers purple. *Lunaria*.
6. Sepals persistent; petals yellow. *Alyssum*.
6. Sepals deciduous; petals white. 7.
7. Pods elliptic, canescent; petals bifid. *Berteroa*.
7. Pods orbicular, glabrous; petals entire. *Koniga*.
8. Pods dehiscent; flowers white. 9.
8. Pods indehiscent; flowers yellow; leaves large. *Myagrurum*.
9. Pods triangular; basal leaves tufted. *Bursa*.
9. Pods didymous, rugose; leaves pinnatifid. *Carara*.
9. Pods orbicular. 10.
10. Pods broadly winged, several seeded; leaves dentate. *Thlaspi*.
10. Pods scale-shaped, smooth; leaves pinnatifid to entire. *Lepidium*.
11. Pods dehiscent; plant usually glabrous. 12.
11. Pods indehiscent, reticulated; plant hispid; leaves lanceolate, sagittate. *Neslia*.
12. Pods pear-shaped; flowers yellow; leaves lanceolate. *Camelina*.
12. Pods globose or ovoid; flowers white. 13.
13. Leaves various; root pungent; pods seldom formed. *Armoracia*.
13. Leaves immersed, dissected, and emersed. *Neobeckia*.
14. Pods dehiscent. 15.
14. Pods indehiscent, beaked. 32.
15. Pods tipped with the style or style none. 16.
15. Pods beaked; flowers yellow. 30.
16. Seeds in two rows in each cavity. 17.
16. Seeds in one row in each cavity. 20.
17. Glabrous, aquatic; leaflets 3-11; flowers white. *Sisymbrium*.
17. Pubescent or glabrous. 18.
18. Leaves simple, not lobed; basal leaves tufted; flowers purplish. *Arabis*.
18. Leaves pinnatifid or bi-pinnatifid; flowers yellow. 19.
19. Plants of wet places; valves nerveless. *Radicula*.
19. Plants of dry places; valves 1-3-nerved. *Sophia*.
20. Leaves simple, not lobed. 21.
20. Leaves lobed or pinnatifid. 26.
21. Leaves entire, obtuse, cordate; plants glabrous, pale green; flowers pale yellow. *Conringia*.
21. Leaves not entire. 22.
22. Leaves ovate or cordate; plants glabrous or nearly so; pods long, slightly constricted between the seeds. 23.
22. Leaves lanceolate or oblanceolate; plants pubescent. 24.
23. Leaves broad, dentate, cordate; flowers white. *Alliaria*.
23. Leaves sometimes lyrate; flowers purple. *Iodanthus*.
24. Stems nearly leafless, slender; flowers white. *Arabidopsis*.
24. Stems leafy. 25.
25. Stems branching, rough-pubescent or hoary; flowers yellow. *Cheirinia*.
25. Stems simple or nearly so; flowers large, purple, fragrant. *Hesperis*.
26. Leaves palmately 3-lobed; stems leafless below; rootstocks pungent. *Dentaria*.
26. Leaves pinnately lobed. 27.
26. Basal and stem-leaves different. 29.
27. Leaves runcinate-pinnatifid. 28.
27. Leaves lyrate; pods and stems 4-angled, glabrous. *Barbarea*.
28. Pods appressed, $\frac{1}{2}$ in. long. *Erysimum*.
28. Pods spreading, 2-4 in. long. *Norta*.
29. Pods elastically dehiscent. *Cardamine*.
29. Pods not elastically dehiscent. *Arabis*.
30. Pods constricted; beaks long and flat. *Sinapis*.
30. Pods not constricted. 31.
31. Pods round; beak conic; seeds in one row, globose; basal leaves pinnatifid. *Brassica*.
31. Pods flattened; beak short; seeds in two rows, ovoid; all leaves deeply pinnatifid. *Diplotaxis*.
32. Pods constricted, spongy; leaves lyrate; flowers yellow or purple. *Raphanus*.
32. Pods 2-jointed; flowers purple; fleshy seaside plants. *Cakile*.

1. **Berterða** DC. Berteroa.

Annual or perennial, stellate-pubescent, erect herbs, with narrow entire leaves, and white flowers in terminal racemes. Petals bifid. Silicles elliptic, canescent, plump. Seeds several in each cavity, winged.

1. **Berterða incàna** (L.) DC. Hoary Berteroa. Pale green, 1-2 ft. high, branched above; leaves lanceolate, obtuse, $\frac{1}{2}$ -1 $\frac{1}{2}$ in. long; racemes elongating, flowers small, numerous.

Recently introduced from Europe and becoming naturalized in waste places. No specimens.

2. **Kòniga** Adans. Sweet Alyssum.

Annual or perennial, weak ascending herbs, slightly pubescent, with entire leaves and white flowers in terminal racemes. Hairs of stem and leaves forked. Silicles oval or orbicular, compressed. Seeds one in each cavity.

1. **Kòniga marítima** (L.) R. Br. Sweet Alyssum. Slightly hoary, branching, 4-12 in. high; basal leaves oblanceolate; stem-leaves linear, $\frac{1}{2}$ -2 in. long, sessile; flowers small, sweet scented; pods glabrous, nearly orbicular, pointed, ascending. Escaped from gardens.

Erie County.

3. **Alýssum** (Tourn.) L. Alyssum.

Annual, erect, stellate-pubescent, tufted herbs, with narrow leaves and yellow flowers in racemes. Silicles small, orbicular, compressed. Seeds one or two in each cavity, wingless.

1. **Alyssum alyssoides** L. Yellow Alyssum. Dwarf hoary herbs, branching from the base, 3-10 in. high; leaves linear-spatulate, entire, $\frac{1}{8}$ -1 $\frac{1}{8}$ inches long; flowers pale yellow, small, petals entire, sepals persistent; pods margined.

In fields and meadows, naturalized from Europe.

Sandusky County.

4. **Dràba** (Dill.) L. Whitlow-grass.

Annual or biennial low tufted herbs, with stellate-pubescent, simple leaves mostly basal, and flowers in slender racemes. Silicles oval or oblong, flat. Seeds many, in two rows in each cavity, wingless.

1. Petals bifid, stems scapose. *D. verna*.

1. Petals entire, stems leafy below. *D. caroliniana*.

1. **Draba verna** L. Vernal Whitlow-grass. Scapes numerous, 1-5 in. high; leaves basal, rosulate, $\frac{1}{2}$ -1 in. long, oblanceolate pubescent, nearly entire; racemes elongating, flowers small, cleistogamous; pods $\frac{1}{4}$ - $\frac{1}{3}$ in. long, shorter than the pedicels.

In fields and on roadsides, naturalized from Europe. Portage County and southern half of state.

2. **Draba caroliniana** Walt. Carolina Whitlow-grass. Scapes short, leafy below, 1-5 in. high; leaves obovate, entire, sessile, pubescent, $\frac{1}{3}$ -1 in. long; petals sometimes wanting; pods broadly linear, crowded.

Indigenous winter-annual in sandy fields, flowering early. Adams, Clark, Erie and Ottawa Counties.

5. **Camélina** Crantz. False-flax.

Erect annual herbs with entire or toothed leaves and small yellow flowers in long racemes. Silicles obovoid, style slender. Seeds many, oblong, in two rows in each cavity, wingless.

1. Glabrous, pods large. *C. sativa*.

1. Pubescent, pods small. *C. microcarpa*.

1. **Camelina sativa** (L.) Crantz. Common False-flax. Stem simple or nearly so, 1-2 ft. high; lowest leaves lanceolate, 2-3 in. long, toothed, petioled; upper leaves smaller, entire, sagittate, sessile; flowers numerous, pods obovoid, spreading, pedicels slender.

A weed in fields, naturalized from Europe. Auglaize, Franklin, Miami, Montgomery, Sandusky.

2. **Camelina microcarpa** Andr. Small-fruited False-flax. Stem as in *C. sativa*, but pubescent and more slender; leaves lanceolate, sessile and clasping, or narrowed at the base; pods smaller.

A weed in cultivated fields, naturalized from Europe. Clark County.

6. **Búrša** (Siegesb.) Weber. Shepherd's-purse.

Annual or winter-annual erect herbs, pubescent with forked hairs, with rosulate basal leaves and small white flowers in racemes. Silicles triangular, emarginate, flattened at right angles with the partition. Seeds 10 or 12 in each cavity, wingless.

1. **Bursa bursa-pastòris** (L.) Britt. Shepherd's-purse. Stems from a long taproot, branching, 6-20 in. high; basal leaves

many, 2-5 in. long, more or less lobed; stem-leaves few, sessile, sagittate, dentate or entire. Flowers begin to bloom when the stem is very short, and the stem lengthens as the flowers open. Blooms throughout the growing season.

Naturalized from Europe. General and abundant.

7. *Neslia* Desv. Ball-mustard.

Annual or biennial erect branching herbs, with entire leaves and small yellow flowers in racemes. Silicles small, round, indehiscent, 1-celled, 1-seeded. Style slender. A monotypic genus.

1. *Neslia paniculata* (L.) Desv. Ball-mustard. Stem slender, branched at the inflorescence, rough-hispid with branched hairs, 1-2 ft. high; leaves lanceolate, acute, sagittate-clasping, 1-2 in. long; racemes elongated; pods globose, reticulated, spreading.

In waste places and grain fields, naturalized from Europe. Escaped in Lake County.

8. *Armoracia* Gaertn. Horseradish.

Tall perennial glabrous herbs from large and long pungent roots, with large leaves and white flowers in paniculate racemes. Silicles nearly globular, style short. Seeds few, in 2 rows in each cavity, wingless.

1. *Armoracia armoracia* (L.) Britt. Horseradish. Stems erect, 2-3 ft. high, leafy; basal leaves rough but glabrous, wavy, crenate or even pinnatifid, 6-12 in. long, petioled; stem-leaves smaller, lanceolate, crenate or dentate, sessile; racemes terminal and axillary, flowers large; pods seldom matured.

Escaped from gardens into moist ground and spreading by the roots which furnish the well-known sauce. Naturalized from Europe. General.

9. *Neobéckia* Greene. Lake Water-cress.

Branching perennial aquatic herbs, with finely dissected immersed leaves and oblong emersed leaves. Flowers large, white racemose, petals longer than the calyx. Silicles ovoid. Seed few, in 2 rows in each cavity.

A monotypic genus of eastern North America.

1. *Neobeckia aquatica* (Eat.) Britt. Lake Water-cress. Stems 1-2 ft. long; immersed leaves 2-6 in. long, pinnately

dissected into many very narrow segments; emerged leaves 1-3 in. long, oblong, entire or serrate, easily broken off; pods 1-6 in. long, with style half as long; pedicels spreading. Detached leaves said to produce new plants.

Indigenous but local in lakes and slow streams. Coshocton, Licking, Lucas, Madison, Perry.

10. **Sisymbrium** (Tourn.) L. Water-cress.

Perennial glabrous aquatic herbs, with pinnate leaves and small white flowers in short erect terminal racemes. Siliques broadly linear on slender pedicels, style stout. Seeds numerous, in 2 rows in each cavity, wingless. A monotypic genus of the Old World.

1. **Sisymbrium nasturtium-aquaticum** L. True Water-cress. Stems creeping and rooting at the nodes, fleshy; leaflets 3-11, roundish, entire or notched, the terminal one largest; petals twice as long as the sepals; pods $\frac{1}{2}$ -1 $\frac{1}{3}$ in. long, ascending on spreading pedicels.

Originally cultivated, but now naturalized in shallow brooks and spring drains. Rather general.

11. **Radicula** Hill. Yellow-cress.

Branching herbs with lyrate or deeply pinnatifid leaves and small yellow flowers in lateral and terminal racemes. Siliques short, terete dehiscent. Seeds numerous, turgid, marginless, in 2 irregular rows in each cavity.

1. Stems creeping, leaves pinnatifid. *R. sylvestris*.
1. Stems erect, leaves lyrate. 2.
2. Glabrous, pods linear to ellipsoid. *R. palustris*.
2. Hirsute, pods globose. *R. hispida*.

1. **Radicula hispida** (Desv.) Britt. Hispid Yellow-cress. Resembles **R. palustris**, but is stouter, taller, 4 ft. high, with lower leaves 10 in. long; hirsute with spreading hairs, especially at the base of the plant; pods globose or a little longer than thick.

Annual or biennial in wet places, more common eastward. Introduced from Europe. Cuyahoga, Erie, Huron, Logan, Monroe, Ottawa, Shelby, Summit.

2. **Radicula palustris** (L.) Moench. Marsh Yellow-cress. Stems erect, bushy, glabrous, 1-3 $\frac{1}{2}$ ft. high, from fibrous roots; leaves 3-7 in. long, lyrate-pinnatifid or the upper ones smaller, lacinate, the lobes oblong and toothed; pods short, linear-oblong.

Annual or biennial in wet places. Indigenous or introduced from Europe. General.

3. **Radicula sylvéstris** (L.) Druce. Creeping Yellow-cress. Stems creeping, branches ascending; leaves 3-5 in. long, petioled, pinnately parted, divisions toothed or lobed, obovate or lanceolate; pods linear, style short.

A perennial in wet places, naturalized from Europe. Cuyahoga, Erie, Lucas.

12. **Lepidium** (Tourn.) L. Peppergrass.

Erect glabrous and pubescent herbs, with entire or pin-natifid leaves and white flowers in racemes. Petals small or wanting. Stamens 6 or 2. Silicles orbicular, dehiscent, flattened contrary to the partition. Seeds 2, pendulous, 1 in each cavity.

1. Stem-leaves clasping by an auricled base; stamens 6. 2.
1. Stem-leaves not clasping by an auricled base; stamens 2. 3.
2. Stem-leaves sagittate-clasping; pods ovate, winged; style minute. *L. campestre*.
2. Stem-leaves broadly auricled; pods broad-ovate, wingless; style conspicuous. *L. draba*.
2. Stem-leaves oval, deeply clasping, pods orbicular. *L. perfoliatum*.
3. Petals present, pods orbicular. *L. virginicum*.
3. Petals wanting or rare. 4.
4. Plant fetid, petals none. *L. ruderales*.
4. Plant scentless, petals none or very small. *L. densiflorum*.

1. **Lepidium ruderales** L. Roadside Peppergrass. Stem erect and branching, glabrous, 6-15 in. high; lower leaves 1-4 in. long, bipinnatifid, upper leaves small, entire; pods flat, oval, marginless, on slender ascending pedicels.

An annual in waste places near cities, naturalized from Europe. No specimens.

2. **Lepidium virginicum** L. Virginia Peppergrass. Stems erect, glabrous, much branched; leaves of all forms from the large pinnatifid lower leaves to the linear entire form near the inflorescence; lower leaves early deciduous; flowers small in elongating racemes; pods flat, obscurely margined at the top.

An indigenous annual weed. General and abundant.

3. **Lepidium densiflorum** Schrad. Wild Peppergrass. Resembles *L. ruderales* and *L. virginicum*. Leaves toothed or pinnatifid; petals usually wanting; pods orbicular, slightly winged at the top.

An annual, more common in the West, lately introduced eastward. Auglaize, Champaign, Cuyahoga, Fayette, Franklin, Lake, Lorain, Wayne.

4. **Lepidium dràba** L. Hoary Peppergrass. Stems erect, hoary, branching, 10-18 in. high; leaves oblong, irregularly dentate, $1\frac{1}{2}$ -2 in. long, the lower petioled, the upper auricle-clasping; flowers corymbose; pods ovate or cordate, style as long as the pod.

Perennial in waste grounds. Fugitive from Europe. Lucas County.

5. **Lepidium campéstre** (L.) R. Br. Field Peppergrass. Stem erect, hoary-pubescent, with scale-like hairs, branching above, 10-18 in. high; basal leaves 2-3 in. long, spatulate, tapering to a petiole, entire or lobed, somewhat rosulate at first; stem leaves crowded, lanceolate, obtuse; pods winged at the apex, rough.

An annual or biennial weed in fields and on roadsides, naturalized from Europe. Rather general.

6. **Lepidium perfoliàtum** L. Perfoliate Peppergrass. Stem branching, erect, 1 ft. high; basal and lower leaves finely pinnatifid, upper leaves oval, entire, deeply clasping around the stem; pods round, on slender, spreading pedicels.

Fugitive from Europe. Portage County.

13. **Caràra** Medic. Wart-cress.

Annual or biennial, diffuse, spreading, fetid herbs, with pinnatifid leaves and small whitish flowers in axillary and terminal racemes. Stamens sometimes only 2. Silicles small, didymous, tuberculate or rugose, indehiscent. Seeds 1 in each cavity.

1. **Carara dídyma** (L.) Britt. Lesser Wart-cress. Stems tufted, slightly pubescent, branching, 2-15 in. long, prostrate; leaves deeply pinnatifid, lower petioled, upper sessile; pods didymous, notched at apex, rugose, separating into 2 ovoid nutlets.

A weed in waste places, introduced from Europe. Lake County.

14. **Thláspi** (Tourn.) L. Penny-cress.

Low winter annuals with rosulate basal leaves, auriculate-clasping stem-leaves, and small white or purplish flowers in paniced racemes. Silicles orbicular, obcordate, winged, flattened contrary to the partition. Seeds 2-8 in each cavity, wingless.

1. Lower stem-leaves not clasping; pods large. *T. arvense*.

1. All the stem-leaves clasping; pods small. *T. perfoliatum*.

1. ***Thlaspi arvense* L.** Field Penny-cress. Stems erect, glabrous, 6-18 in. high, branching above; basal leaves petioled, oblanceolate, entire, falling away early; stem-leaves slightly dentate, 1-3 in. long, the lower sessile, the upper clasping by a sagittate base; flowers very small, white; pods nearly orbicular when ripe, $\frac{1}{3}$ - $\frac{1}{2}$ in. broad, winged all around, notched at the top.

In waste places, naturalized from Europe. Cuyahoga, Henry, Highland, Belmont (Laughlin Herbarium).

2. ***Thlaspi perfoliatum* L.** Perfoliate Penny-cress. Stems slender, erect, glabrous, 3-7 in. high, usually branching at the base; basal leaves petioled, ovate or orbicular; stem-leaves ovate, sessile, clasping by an auricled base, $\frac{1}{2}$ -1 in. long, upper leaves nearly perfoliate; flowers small, white; pods $\frac{1}{4}$ in. broad or less, winged, notched at the top.

In gravel soil, adventive from Europe. Clermont County.

15. ***Myagrum* L.** Myagrum.

Annual erect branching herbs, with entire or undulate lanceolate leaves and small yellow flowers in elongating racemes. Longer stamens somewhat connate in pairs. Silicles obcuneate to spatulate, indehiscent, 1-seeded. A monotypic genus.

1. ***Myagrum perfoliatum* L.** Myagrum. Stem glabrous and glaucous; lower leaves narrowed into petioles; upper leaves oblong, obtuse, 2-5 in. long, with rounded basal lobes; pods as long as the ascending pedicels.

In waste places, fugitive from Europe. Lake County.

16. ***Alliaria* Adans.** Garlic Mustard.

Biennial, erect branching herbs, glabrous or slightly pubescent, with broad, coarsely dentate cordate or rounded leaves and white flowers in racemes. Sepals caducous, petals long-clawed, stamens 6. Siliques long, linear, dehiscent from the base. Seeds in 1 row in each cavity, wingless.

1. ***Alliaria alliaria* (L.) Britt.** Garlic Mustard. Stems tall, 1-3 ft. high, nearly glabrous; leaves broadly ovate or cordate, petiolate, 2-7 in. broad; basal leaves round, crenate, long petioled; flowers small, white; pods 1-2 in. long, on short stout pedicels.

Naturalized from Europe in waste places near dwellings. No specimens. (Erie County—Moseley Herbarium).

17. **Sòphia** Adans. Tansy-mustard.

Annual canescent or pubescent herbs with finely pinnatifid leaves and small yellow flowers in elongating racemes. Siliques narrow, pedicelled. Seeds very small, in 1 or 2 rows in each cavity, wingless.

1. Canescent, pods horizontal. *S. pinnata*.
1. Green, pods ascending. *S. incisa*.

1. **Sophia pinnata** (Walt.) Howell. Pinnate Tansy-mustard. Stems slender, erect, branching, canescent, 8-24 in. tall; leaves finely 2-pinnatifid, 2-4 in. long; flowers very small, yellowish; pods erect, shorter than the horizontal pedicels; seeds in 2 rows in each cavity.

Indigenous in dry situations. Hamilton, Jackson, Miami, Montgomery, Ottawa.

2. **Sophia incisa** (Engelm.) Greene. Western Tansy-mustard. Resembling **S. pinnata**, but not canescent. Leaves pinnatifid; pods ascending, about the length of the pedicels; seeds in 1 row in each cavity.

An indigenous western polymorphous species. Erie, Miami, Portage.

18. **Cheirínia** Link. Cheirinia.

Annual and biennial erect branching herbs, pubescent with 2-parted hairs, with lanceolate entire or toothed leaves, and yellow flowers in racemes. Siliques linear, 4-sided. Seeds in 1 row in each cavity, wingless.

1. Slender, pubescent; flowers small, pods short and spreading. *C. cheiranthoides*.
1. Stout, pubescent, pods long and spreading. 2.
2. Leaves repand or lobed, flowers medium. *C. repanda*.
2. Leaves lanceolate, dentate, flowers large. *C. aspera*.

1. **Cheirinia cheiranthoides** (L.) Link. Wormseed Mustard. Stems erect, roughish, branching, $\frac{2}{3}$ -2 ft. high; leaves lanceolate, usually entire, 1-4 in. long; flowers yellow; pods slender, erect, on diverging pedicels.

A biennial, on banks of streams or in waste places, introduced from Europe. Hamilton, Lake, Lucas, Portage.

2. **Cheirinia repanda** (L.) Link. Repand Cheirinia. Stem pubescent, 1 ft. high, much branched; leaves repand-denticulate, lanceolate, lower ones sometimes lobed, 1-3½ in. long; flowers larger than in **C. cheiranthoides**; pods long, spreading, on stout pedicels.

Annual in waste ground, adventive from Europe. Erie, Logan.

3. **Cheirinia áspera** (DC.) Britt. Western Cheirinia. Stem nearly simple, hoary-pubescent, 1-3 ft. high; leaves narrowly lanceolate, usually dentate, 1-2 in. long; flowers large, orange-yellow, in a close raceme; petals orbicular, on slender claws; pods 1-4 in. long, rough, spreading on slender pedicels, 4-sided.

An indigenous biennial, in open places. Franklin County.

19. **Erýsimum** (Tourn.) L. Hedge-mustard.

Tall erect annual herbs, with pinnatifid leaves and small yellow flowers in racemes. Siliques linear, round. Seeds many, in 1 row in each cavity, marginless.

1. **Erysimum officinále** L. Hedge-mustard. Stem branching, somewhat pubescent, 1-3 ft. high; leaves runcinate, the lower petioled, the upper sessile, lobes 7-13, the end lobe largest; flowers pale yellow; pods linear, $\frac{1}{2}$ in. long, closely appressed to the stem. Lower leaves sometimes rosulate.

A common weed in waste places, naturalized from Europe. General and abundant.

20. **Nórta** Adans. Hedge-mustard.

Erect annual herbs, with pinnatifid leaves, and medium-sized yellow flowers in loose racemes. Siliques very long, linear, terete, spreading or ascending. Seeds wingless, in 1 or 2 rows in each cavity.

1. Pods spreading; leaves runcinate-pinnatifid. *N. altissima*.

1. Pods ascending; leaves runcinate, with a large terminal segment. *N. irio*.

1. **Norta altíssima** (L.) Britt. Tall Hedge-mustard. Stem glabrous, much branched, 2-4 ft. high; lower leaves narrowly runcinate, upper leaves pinnatifid into narrow segments; flowers pale yellow; pods 2-4 in. long, rigid, spreading.

A bad weed introduced from the Northwest, but native of Europe. Belmont, Cuyahoga, Erie, Greene, Jackson, Lake, Ottawa, Portage, Wayne.

2. **Norta írio** (L.) Britt. Longleaf Hedge-mustard. Similar to **N. altissima**. Leaves runcinate-pinnatifid, the terminal segment large.

In waste places, adventive from Europe. Portage County.

21. **Conríngia** (Heist.) Adans. Hare's-ear Mustard.

Annual erect glabrous herbs, with elliptic, entire sessile or cordate-clasping leaves, and yellowish white flowers in terminal racemes. Sepals and petals narrow. Siliques linear, 4-angled, bilocular. Seeds wingless, in 1 row in each cavity.

1. **Conringia orientàlis** (L.) Dum. Hare's-ear Mustard. Stem usually simple, 1-3 ft. tall, somewhat succulent; leaves light green, obtuse, $\frac{1}{3}$ in. long; petals nearly twice as long as the sepals; pods spreading.

Adventive from Europe, becoming a bad weed, more common in the Northwest. Cuyahoga, Geauga, Lake.

22. **Héseris** (Tourn.) L. Dame's Rocket.

Biennial or perennial erect herbs, pubescent with forked hairs, with simple leaves and large purple flowers in racemes. Stigma 2-lobed. Siliques long, slender, dehiscent. Seeds marginless, globose, in 1 row in each cavity.

1. **Hesperis matronàlis** L. Dame's Rocket. Stem branched, 2-3 ft. tall; leaves lanceolate, serrate, acuminate, lower leaves long petioled, 3-8 in. long, upper leaves smaller, sessile; flowers an inch broad, fragrant, petals spreading; pods linear, 2-4 in. long.

A native of Europe, escaped from cultivation. Belmont (Laughlin Herbarium), Franklin, Hamilton, Portage.

23. **Arabidòpsis** (DC.) Schur. Mouse-ear Cress.

Annual erect branching herbs, pubescent with forked hairs, with entire or toothed leaves and small white flowers in terminal racemes. Siliques linear, dehiscent. Seeds wingless, in 1 row in each cavity.

1. **Arabidopsis thaliàna** (L.) Britt. Mouse-ear Cress. Stem slender, hairy at the base, 1-16 in. high; basal leaves rosulate, obovate, entire or toothed, petioled, 1-2 in. long; stem-leaves smaller, few, acute, sessile; flowers small, petals about twice the length of the calyx; pods pointed, spreading.

In old fields and rocky places, naturalized from Europe. Ashtabula, Clinton, Lucas, Montgomery.

24. **Barbarèa** R. Br. Winter-cress.

Biennial or perennial erect branching herbs, with angled stems, pinnatifid leaves and yellow flowers in racemes. Stamens 6. Siliques linear, 4-angled. Seeds wingless, in 1 row in each cavity.

- | | |
|-------------------------------------|----------------------|
| 1. Lateral leaf-segments 1-4 pairs. | 2. |
| 1. Lateral leaf-segments 4-8 pairs. | <i>B. verna</i> . |
| 2. Pods spreading. | <i>B. barbarea</i> . |
| 2. Pods appressed. | <i>B. stricta</i> . |

1. **Barbarèa Barbarèa** (L.) MacM. Yellow Winter-cress. Stems erect, glabrous, 1-2 ft. high, often in tufts; basal leaves rosulate, 2-5 in. long, lyrate with a large rounded terminal division, and 1-4 pairs of lateral segments; upper leaves nearly or quite sessile, obovate, cut-toothed at the base; flowers bright yellow; pods obtusely 4-angled, 1 in. long on slender spreading pedicels. The thick basal leaves are found in winter and used as a salad.

Indigenous in the Northwest, but apparently introduced in the Eastern States. General.

2. **Barbarea stricta** Andrz. Erect Winter-cress. Stem and leaves similar to **B. barbarea**, except that the lateral divisions of the leaves are broader and more acute; flowers pale yellow, corymbose, the rachis elongating in fruit; pods erect, appressed.

In fields and meadows, naturalized from Europe. Erie County.

3. **Barbarea verna** (Mill.) Aschers. Early Winter-cress. Similar to **B. stricta**, but less stout, except the pedicels which are stouter; leaves 4-8 pairs of lateral segments; pods 1-3 in. long, sharply 4-angled, slightly compressed.

Introduced from Europe, and flowering earlier than the other species. Sometimes cultivated for salad and called Scurvy-Grass. Belmont, Harrison, Portage, Preble.

25. **Iodanthus** T. & G. Purple Rocket.

Perennial erect glabrous herbs, with dentate or lyrate leaves, and purplish flowers in paniced racemes. Siliques long, linear, somewhat flattened. Seeds oblong, wingless, in 1 row in each cavity. A monotypic genus.

1. **Iodanthus pinnatifidus** (Mx.) Steud. Purple Rocket. Stem slender, branching, 1-3 ft. high; lower leaves ovate or cordate, sometimes lyrate, dentate, 2-8 in. long, tapering into a long margined petiole which is clasping at the base; stem-leaves smaller, ovate-lanceolate, the upper nearly sessile; flowers many, small, lavender-purple; pods about 1 in. long, spreading or ascending.

Indigenous on low river banks or creeks. Rather general.

26. *Ārabis* L. Rock-cress.

Annual or biennial erect, glabrous or pubescent herbs, with entire or lobed, sometimes pinnatifid leaves, and white or purple flowers in racemes. Siliques linear, dehiscent. Seeds in 1 or 2 rows in each cavity, winged or wingless.

1. Flowers white. 2.
1. Flowers purple or purplish; basal leaves spatulate; stem-leaves lanceolate. 8.
2. Basal and stem-leaves similar, pinnatifid; plant glabrous. *A. virginica*.
2. Basal and stem-leaves different. 3.
3. Basal leaves lyrate; stem-leaves spatulate to linear; plant glabrous above, pubescent below. *A. lyrata*.
3. Basal leaves on marginal petioles; stem-leaves clasping; plant pubescent. 4.
3. Basal leaves petioled. 6.
4. Petals as long as the calyx. 5.
4. Petals longer than the calyx; pods erect or appressed. *A. hirsuta*.
5. Flowers greenish white; pods spreading. *A. dentata*.
5. Flowers bright white; pods ascending. *A. patens*.
6. Plant glabrous and glaucous; stem-leaves clasping; petals slightly longer than the calyx; pods long. 7.
6. Plants glabrous above, pubescent below; stem-leaves not clasping; petals twice as long as the calyx; pods scythe-shaped. *A. canadensis*.
7. Petals yellowish-white; pods appressed. *A. glabra*.
7. Petals greenish-white; pods recurved-spreading. *A. laevigata*.
8. Plant glabrous and somewhat glaucous; pods close, erect. *A. drummondii*.
8. Plant glabrous above; purple-glaucous; pods spreading. *A. brachycarpa*.

1. *Arabis dentata* T. & G. Toothed Rock-cress. Stems slender, upright, branching from the base, 1-2 ft. high; leaves broad-ovate or obovate, dentate, basal leaves 2-4 in. long, stem-leaves auricled; pods linear, ascending; seeds marginless, in 1 row in each cavity.

An indigenous biennial or perennial. Rather general.

2. *Arabis patens* Sull. Spreading Rock-cress. Stem simple, erect, leafy, 1-2 ft. high, densely pubescent; basal leaves dentate, 1-3 in. long, stem-leaves sessile, cordate-clasping, ovate or oblong, the middle ones largest; pods narrow, flat; seeds narrowly winged, in 1 row in each cavity.

An indigenous biennial. Franklin County.

3. *Arabis hirsuta* (L.) Scop. Hairy Rock-cress. Stem erect, nearly simple, rough-hairy or nearly glabrous, 1-2 ft. high; basal leaves obovate, obtuse, dentate, 1-2 in. long on margined petioles; stem-leaves lanceolate or oblong, partly clasping by a somewhat heart-shaped base; pods linear, 1-2 in. long; seeds narrowly winged, in 1 row in each cavity.

A European biennial, in rocky places. Rather general.

4. *Arabis glabra* (L.) Bernh. Tower Mustard. Stems erect, usually simple or branched at the base, 2-4 ft. high, glabrous

and glaucous, pubescent below; basal leaves 2-10 in. long, oblanceolate, coarsely dentate or lyrate; stem-leaves smaller, lanceolate, usually entire, with a sagittate base; petals little longer than the sepals; pods linear, 2-3 in. long, erect and appressed; seeds marginless, in 1 row in each cavity.

A biennial in fields and rocky places, perhaps indigenous. Auglaize, Belmont, Cuyahoga, Franklin, Geauga, Hamilton, Lucas, Richland.

5. ***Arabis laevigata*** (Muhl.) Poir. Smooth Rock-cress. Stems erect, 1-3 ft. high, glabrous and glaucous, nearly simple; basal leaves 2-3 in. long, obovate, dentate, rarely lyrate; stem-leaves sessile, lanceolate to linear, entire or few-toothed, clasping by an auricled base; pods 3-4 in. long, recurved-spreading; seeds winged, in 1 row in each cavity.

An indigenous biennial in rocky woods. General.

6. ***Arabis canadensis*** L. Sickie-pod Rock-cress. Stems erect, simple, 1-3 ft. high, smooth above; basal leaves 3-7 in. long, dentate, narrowed into a petiole, early withering; stem-leaves sessile, pubescent, lanceolate, pointed at each end, toothed or entire; pods flat, 2-3½ in. long, scythe-shaped, pendulous on hairy pedicels; seeds winged, in 1 row in each cavity.

An indigenous biennial in woods and ravines. General.

7. ***Arabis virginica*** (L.) Trel. Virginia Rock-cress. Stems low, diffuse, 6-12 in. long; leaves pinnatifid, 1-3 in. long; flowers very small; pods linear, ascending; seeds orbicular, winged, in 1 row in each cavity.

Indigenous in open situations. Clark, Clermont, Lawrence.

8. ***Arabis lyrata*** L. Lyre-leaf Rock-cress. Stems tufted, erect, 4-12 in. high; basal leaves lyrate, 1-2 in. long; stem-leaves spatulate or linear, entire or toothed, scattered; petals much longer than the calyx; pods linear, ascending; seeds wingless, in 1 row in each cavity.

An indigenous biennial in rocky places. Auglaize, Erie, Muskingum, Pike, Wood.

9. ***Arabis drummondii*** Gr. Drummond's Rock-cress. Stems erect, 2/3-3 ft. tall, glabrous, somewhat glaucous; basal leaves rosulate, oblanceolate, dentate or entire narrowed into a long petiole; stem-leaves sagittate-lanceolate, erect, entire; flowers pink-purple or white; pods blunt, 2-4 in. long; seeds winged, in 2 rows in each cavity.

An indigenous biennial in rocky places. No specimens.

10. **Arabis brachycarpa** (T. & G.) Britt. Purple Rock-cress. Stems erect, simple or sparingly branched, 1-3 ft. high, glabrous except at the base, glaucous and purplish; basal leaves rosulate, densely stellate-pubescent, obovate, dentate, petioled, 1-3 in. long; stem leaves glabrous, sagittate-lanceolate, entire or few-toothed; flowers pink-purple or white; petals twice the length of the calyx; pods linear, 1-3½ in. long; seeds winged, in 2 rows in each cavity.

An indigenous biennial in sandy or rocky situations. Erie, Ottawa.

27. **Cardamine** (Tourn.) L. Bitter-cress.

Erect and ascending branching herbs, mostly glabrous, with tuberous rootstocks or fibrous roots, simple or pinnately divided leaves, and white or purplish flowers in racemes or corymbs. Stamens 6 or 4. Siliques long, flat, elastically dehiscent. Seeds flat, wingless, in 1 row in each cavity.

1. Leaves simple, entire or coarsely dentate. 2.
1. Leaves simple, pinnately divided. 4.
2. Stems erect from a tuberous base; basal and stem-leaves different. 3.
2. Stems decumbent; roots fibrous; basal and stem-leaves similar; flowers white, small. *C. rotundifolia*.
3. Plant early, pubescent, purplish; flowers purple. *C. douglassii*.
3. Plant later, glabrous, green; flowers white. *C. bulbosa*.
4. Stems erect. 5.
4. Stems weak; flowers white, very small. *C. parviflora*.
5. Flowers white or purplish, showy. *C. pratensis*.
5. Flowers white, small. 6.
6. Stems mostly leafless; leaves rosulate, pubescent; stamens 4. *C. hirsuta*.
6. Stems leafy; leaves glabrous. 7.
7. Leaflets obovate or oblong; plant 8 in. to 3 ft. tall, branched. *C. pennsylvanica*.
7. Leaflets linear; plant 6 in. to 1 ft. tall, branched from the base. *C. arenicola*.

1. **Cardamine douglassii** (Torr.) Britt. Purple Bitter-cress. Stems clustered from a perennial tuberous rootstock, usually simple, 4-15 in. high; basal leaves slender petioled, ovate-orbicular, 1 in. broad, cordate, somewhat angular, purple beneath; stem-leaves close, sessile, nearly dentate; flowers in a lengthening raceme, corymbose at first, showy; pod 1 in. long, pointed, erect.

Indigenous in low, shady, moist places. General and abundant.

2. **Cardamine bulbosa** (Schreb.) B. S. P. Bulbous Bitter-cress. Stems several from a slender tuberous rootstock, 6-20 in. high; basal leaves oblong or cordate-ovate, 1-1½ in. long, on long petioles; stem-leaves scattered, lower petioled, upper sessile, toothed or entire; pods as in **C. douglassii**.

Perennials in wet meadows and along streams, blooming two or three weeks later than *C. douglassii*. Indigenous and general.

3. *Cardamine rotundifolia* Mx. Round-leaf Bitter-cress. Stems branching, stoloniferous; leaves ranging from petioled at the base to sessile near the end of the stem, oval, undulate or entire, often cordate, 1 in. broad, occasionally with a pair of small leaflets on the lower petioles; pods linear, pointed, $\frac{1}{2}$ - $\frac{2}{3}$ in. long.

Indigenous perennials in cool springs or shallow shaded streams. Belmont, Noble.

4. *Cardamine pratensis* L. Meadow Bitter-cress. Stem from a short rootstock, 8 in. to 2 ft. high, nearly simple; leaves pinnately divided; leaflets 7-15, dentate or entire, the lower large, broad and petioled, the upper sessile and narrow; petals white or rose-color, three times the length of the sepals; pods $\frac{2}{3}$ - $1\frac{1}{3}$ in. long, style thick.

Perennials in wet meadows or bogs, introduced from Europe but indigenous in the North and Northwest. Portage County.

5. *Cardamine hirsuta* L. Hairy Bitter-cress. Stem nearly simple, 4-10 in. high; leaves chiefly basal, 1-4 in. long; leaflets 5-11, somewhat pubescent on the upper surface, the terminal segment orbicular, entire or few-toothed, larger than the lateral segments; stem-leaves, if any, much reduced; pods linear, appressed, 1 in. long.

Annual or biennial in waste places. Perhaps introduced from Europe. Lake County.

6. *Cardamine pennsylvanica* Muhl. Pennsylvania Bitter-cress. Stems usually much branched, 8 in. to 3 ft. tall, somewhat fleshy, leafy; basal leaves 2-6 in. long, larger and broader than the stem-leaves, segments 7-11, the terminal part obovate, all more or less confluent along the rachis; racemes lateral and terminal; pods linear, 1 in. long.

Indigenous annual, or biennial in damp places. General.

7. *Cardamine arenicola* Britt. Sand Bitter-cress. Stem much branched from the base, leafy, 6-12 in. high; leaves with numerous linear divisions, usually entire, the basal leaves slightly larger; pods erect, less than 1 in. long.

Indigenous annuals in wet sandy soil. Perhaps a form of *C. parviflora*. Lake County.

8. **Cardamine parviflora** L. Small-flowered Bitter-cress. Stem erect or ascending, branching, 2-15 in. high, very slender, with scattered leaves; leaves with 5-11 segments, oblong or linear, the terminal ones often rounded, basal leaves largest; flowers scarcely a line broad; pods slender, scarcely 1 in. long, on a somewhat zigzag peduncle.

Indigenous annuals or biennials, in dry, rocky or barren soil. Delaware, Fairfield, Hocking, Lawrence.

28. **Dentaria** (Tourn.) L. Toothwort.

Perennial, mostly glabrous herbs, with scaly or toothed rootstocks of a pungent taste. Stems leafless below, leaves 2 or 3, palmately parted or compound. Flowers white or purplish, in a short raceme or corymb. Siliques linear, flat, dehiscent from the base. Seeds oval, wingless, in 1 row in each cavity.

1. Basal and stem-leaves similar. 2.
1. Basal and stem-leaves different; rootstock jointed. *D. heterophylla*.
2. Stem-leaves 2, opposite; rootstock continuous. 3.
2. Stem-leaves usually 3; rootstock jointed. 4.
3. Leaf segments ovate or ovate-oblong. *D. diphylla*.
3. Leaf segments linear. *D. multifida*.
4. Leaves alternate, sometimes 2-7. *D. maxima*.
4. Leaves whorled. *D. laciniata*.

1. **Dentaria diphylla** Mx. Two-leaf Toothwort. Stem stout, erect, glabrous, 8-12 in. high, from a continuous toothed rootstock; basal leaves long-petioled, 4-5 in. broad, ternate, ovate, dentate, often found in winter; stem-leaves similar, 2, opposite; flowers white, petals twice the length of the sepals; pods 1 in. long, but seldom maturing.

Indigenous in woods and meadows. Eastern half of the state.

2. **Dentaria máxima** Nutt. Large Toothwort. Similar to **D. diphylla**, but larger. Rootstock interrupted, tuberled; leaves 2-7 (usually 3), alternate; flowers sometimes purpletinged.

Indigenous in damp woods, but local. No specimens.

3. **Dentaria heterophylla** Nutt. Slender Toothwort. Stem slender, scapose, glabrous or slightly pubescent; rootstock jointed, near the surface; whole plant purplish, flowers deepest; stem-leaves generally 2, opposite, ternate, divisions linear, entire, 1-1½ in. long; flowers few; pods 1 in. long, ascending.

Indigenous in damp woods. Blooms later than *D. laciniata* and the whole plant soon disappears. Auglaize, Belmont, Clermont, Hocking, Vinton.

4. *Dentaria laciniata* Muhl. Cutleaf Toothwort. Stem glabrous or slightly pubescent, 8-15 in. high, from a deep, jointed rootstock; stem-leaves 3, whorled, petioled, 2-5 in. broad, 3-cleft, the lateral divisions often 2-cleft; all lacinate; basal leaves similar, long-petioled, appearing after flowering time; flowers white or purplish; pods linear, ascending.

Indigenous in woods, blooming earlier than *D. diphylla*. General and abundant.

5. *Dentaria multifida* Muhl. Multifid Toothwort. Stem slender, scapose, glabrous; rootstocks continuous; basal leaves long-petioled, about 2 in. broad, ternate, segments linear, bipinnatifid; stem-leaves similar, but smaller; petals white, nearly twice as long as the sepals; pods slender, ascending, long-beaked.

In rocky woods in North Carolina to Tennessee and Alabama. Hamilton County.

29. *Lunària* (Tourn.) L. Honesty.

Annual or biennial erect pubescent herbs, with broad dentate cordate leaves and large purple flowers in racemes. Lateral sepals saccate at the base. Silicles stalked, flat, elliptic or oblong, dehiscent. Septum hyaline, silvery. Seeds large, circular, winged, in 2 rows in each cavity.

1. *Lunaria ànnua* L. Honesty. Stems stout, branching, 2-4 ft. tall; earliest leaves opposite, broadly cordate, dentate, 3-6 in. long, petioled, later leaves alternate; flowers large, purple; pods $1\frac{1}{2}$ -2 in. broad, elliptic, drooping on a slender stipe. A European garden flower, cultivated for its shining septum.

Escaped from gardens or persisting after cultivation. No specimens. Belmont County (Laughlin Herbarium).

30. *Sinàpis* L. Mustard.

Annual erect, more or less hispid herbs, with lobed leaves and large yellow flowers in racemes. Siliques terete, constricted between the seeds and tipped with a long flat beak. Seeds large, spherical, light-colored, in 1 row in each cavity.

1. Leaves lyrate; pods hispid-pubescent. *S. alba*.

1. Leaves slightly lobed; pods glabrous. *S. arvensis*.

1. **Sinapis álba** L. White Mustard. Stem branching, hispid-pubescent, 1-2 ft. high; lower leaves with a large terminal leaflet and several pairs of smaller ones, dentate, 6-8 in. long; upper leaves smaller, to lanceolate, dentate; pods bristly, constricted, ascending, beak as long as the pod.

A European herb, escaped from cultivation. Lucas County.

2. **Sinapis arvénsis** L. Corn Mustard. Stem branching 1-2 ft. high; leaves like those of **S. álba**, but less lobed, the upper leaves rhombic, sessile; pods glabrous, knotty, ascending, beak $\frac{1}{3}$ as long.

A troublesome annual from Europe. General, except in southern part.

31. **Brássica** (Tourn.) L. Cabbage, Mustard, Turnip.

Annual or biennial erect branching herbs, sometimes tall, with pinnatifid or lyrate basal leaves, dentate or entire upper leaves, and showy yellow flowers in long racemes. Siliques long, sessile, terete or 4-sided, tipped with a conic, often 1-seeded beak. Seeds globose, wingless, in 1 row in each cavity.

1. Leaves not clasping at the base. 2.
1. Upper leaves clasping at the base. 3.
2. Plant green, hirsute; pods appressed. *B. nígra*.
2. Plant pale glaucous, glabrous; pods spreading. *B. júncea*.
3. Leaves auricled. 4.
3. Leaves not auricled; plant glaucous-blue. *B. oleracea*.
4. Plant hispidulous. *B. campestris*.
4. Plant entirely glabrous. *B. nápus*.

1. **Brassica nígra** (L.) Koch. Black Mustard. Stems 2-7 ft. high, branching, bristly, with scattered hairs; leaves hispid or hirsute, lower leaves with one large terminal lobe and several small lateral ones; upper leaves lanceolate, nearly entire; flowers bright yellow; pods linear, 4-sided, appressed; seeds dark brown, pungent.

A common weed, introduced from Europe.

2. **Brassica júncea** (L.) Cosson. Indian Mustard. Stems 1-4 ft. tall, coarse, pale, glabrous and somewhat glaucous; lower leaves lyrate, 4-6 in. long, petioled; upper leaves much smaller, lanceolate or oblong, nearly entire, sessile; flowers larger than those of **B. nígra**; pods long, spreading.

In grain fields and waste places, recently introduced from Asia. Portage, Wayne.

3. **Brassica campéstris** L. Common Turnip. Stem 1-3 ft. high, glaucous, branching; lower leaves lyrate, petioled, pubescent; upper leaves lanceolate, sessile, glabrous; flowers large, pale yellow; pods long, spreading; root fleshy; biennial.

Introduced from Europe and persisting in cultivated ground. Auglaize, Franklin, Miami, Wayne.

4. **Brassica napus** L. Rape. Similar to **B. campestris**, but entirely glabrous. Racemes dense.

Introduced from Europe. Franklin County.

5. **Brassica oleracea** L. Cabbage. Stem thick and hard. Leaves large, fleshy, strongly-veined, forming a head the first year.

A biennial, occasionally spontaneous. No specimens.

32. **Diplofaxis** DC. Rocket.

Annual or perennial herbs, similar to the Brassicas, with pinnatifid or lobed leaves, and rather large yellow flowers in loose terminal racemes. Siliques elongated, flat. Seeds wingless, in 2 rows in each cavity.

1. **Diplofaxis tenuifolia** (L.) DC. Wall Rocket. Stem 1-4 ft. high, leafy, branched, glabrous and slightly glaucous; leaves 3-6 in. long, thin, deeply pinnatifid, divisions narrow; pods 1-1½ in. long, erect on slender pedicels.

A perennial in waste places, adventive from Europe. Cuyahoga County.

33. **Raphanus** (Tourn.) L. Radish.

Annual or biennial erect herbs with lyrate leaves and showy flowers in racemes. Siliques oblong, acuminate, coriaceous, spongy, indehiscent. Seeds spherical.

1. Flowers yellow, turning purple or white; pods moniliform. *R. raphanistrum*.

1. Flowers pale purple; pods short and thick. *R. sativus*.

1. **Raphanus raphanistrum** L. Wild Radish. Stem 1-2½ ft. high, much branched, slightly pubescent; lower leaves rough, 4-8 in. long, lyrate with a large terminal lobe and smaller lobes, all dentate; upper leaves smaller, oblong; flowers ½-¾ in. broad, purple veined; pods 1-1½ in. long, constricted somewhat like those of **Sinapsis arvensis**; root slender.

A troublesome weed in fields from Europe. Lake County.

2. **Raphanus sativus** L. Garden Radish. Similar to **Raphanus raphanistrum**, but with pale purple flowers, and shorter pods not moniliform.

Cultivated for the fleshy root and persistent for a year or two. Rather general.

34. **Cakile** (Tourn.) Mill. Sea Rocket.

Fleshy, diffuse, annual herbs of the seashore, with glabrous freely branching stems, and purplish flowers in racemes. Siliques short, 2-jointed, indehiscent; the joints 1-seeded, or the lower part seedless, and the upper part breaking off when mature.

1. **Cakile edéntula** (Bigel.) Hook. Sea Rocket. Stems about 1 ft. high, ascending from a deep root, bushy; leaves obovate, sinuate-dentate, narrowed at the base, the lower ones 3-5 in. long; flowers small, petals purplish, clawed; pods short, upper joint larger than the lower.

Indigenous in wet sands of the seashore and of the Great Lakes. Ashtabula, Cuyahoga, Erie, Lake.

Barnesville, Ohio.